Name **KEY**

Review – Chemical Equations

Period _____

In each blank, write the word or phrase that best completes the following passage.

When a piece of magnesium metal is added to hydrochloric acid, fizzing occurs and hydrogen gas

is released. The fizzing is evidence that a(n) __Chemical reaction__ has occurred

between magnesium and hydrochloric acid. Magnesium and hydrochloric acid in this case are called the

__reactants__ of the reaction, and the hydrogen gas that is released is called a(n)

__products__ of the reaction. Some other indications that chemical reactions have

occurred might be change of color or __temperature__ or the formation of a solid

__precipitate__. If a thermometer is placed into a mixture undergoing a reaction,

you might observe that the temperature has gone up or down, indicating that __energy (heat)__ was being

released or absorbed. The shorthand form by which a reaction is represented is called a(n)

__Chemical equation__. In using this method of representation, you must satisfy the

__Law of Conservation of Mass__, a principle that states that matter is neither created nor

destroyed during chemical processes. In order to satisfy this principle, you must select the proper numerical

__Coefficients__, placed in front of each chemical, to indicate the number of units of each

substance taking part in the chemical change.

Express *in words* what each of the terms or symbols means in the following chemical equation:

$$Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$$

Mg __magnesium__   (aq) __aqueous__

(s) __solid__   → __yields__
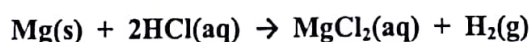
+ __reacts with__   MgCl$_2$ __magnesium chloride__

2 __coefficient (2 units)__   H$_2$ __hydrogen__

HCl __hydrochloric acid__   (g) __gas__

Balance each of the following chemical equations.

1. ____ B_2S_3 + __6__ H_2O → __2__ H_3BO_3 + __3__ H_2S

2. __4__ PH_3 + __8__ O_2 → __6__ H_2O + ____ P_4O_{10}

3. __2__ C_3H_8O + __9__ O_2 → __6__ CO_2 + __8__ H_2O

4. __3__ SiF_4 + __3__ H_2O → __2__ H_2SiF_6 + ____ H_2SiO_3

5. ____ $Pb(C_2H_3O_2)_2$ + ____ K_2CrO_4 → ____ $PbCrO_4$ + __2__ $KC_2H_3O_2$
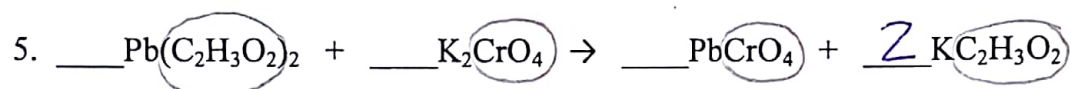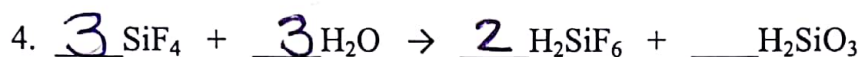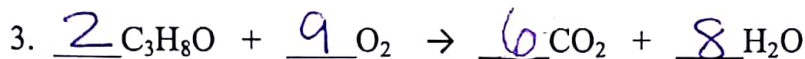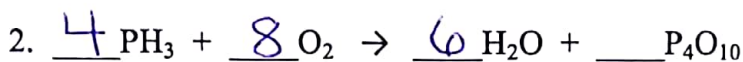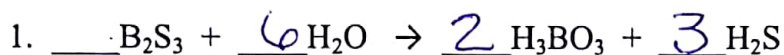
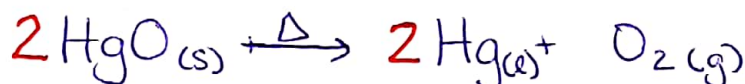**Write a balanced chemical equation for each of the reactions described below. Include physical states.**

1. Aluminum metal burns in pure oxygen gas to produce solid aluminum $\overset{+3}{\text{o}}\overset{-2}{\text{xide}}$.

$$4\,Al_{(s)} + 3\,O_{2(g)} \longrightarrow 2\,Al_2O_{3\,(s)}$$
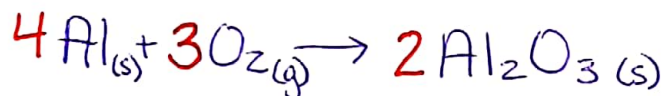
2. When solid $\overset{+2}{\text{mer}}\overset{-2}{\text{cury(II)o}}$xide is heated, it breaks down to form liquid mercury and oxygen gas.

$$2\,HgO_{(s)} \overset{\Delta}{\longrightarrow} 2\,Hg_{(\ell)} + O_{2\,(g)}$$

3. Copper metal and $\overset{+2}{\text{iron}}\overset{-1}{\text{(II)ni}}$trate in solution are formed when iron metal is added to a solution of $\overset{+2}{\text{cop}}\overset{-1}{\text{per(II)ni}}$trate.

balanced!

$$Fe_{(s)} + Cu(NO_3)_{2(aq)} \longrightarrow Fe(NO_3)_{2\,(aq)} + Cu_{(s)}$$
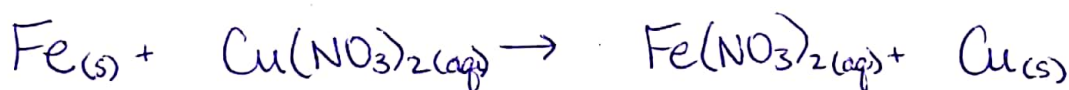
4. The addition of a solution of ammonium $\overset{+1}{\text{sul}}\overset{-2}{\text{fate}}$ to a solution of $\overset{+2}{\text{lead(II)chl}}\overset{-1}{\text{oride}}$ results in the formation of ammonium $\overset{+1}{\text{chl}}\overset{-1}{\text{oride}}$, which remains in solution, and a precipitate of $\overset{+2}{\text{lead(II)s}}\overset{-2}{\text{ulfate}}$.

$$(NH_4)_2SO_{4\,(aq)} + PbCl_{2\,(aq)} \longrightarrow 2\,NH_4Cl_{(aq)} + PbSO_{4(s)}$$
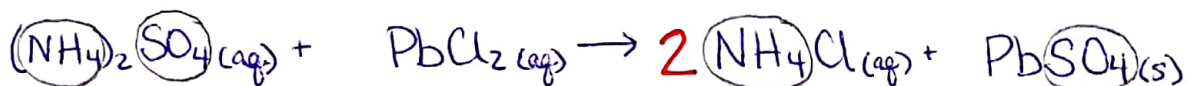
5. $\overset{+1}{\text{Hydro}}\overset{-2}{\text{gen sul}}$fide gas reacts with pure oxygen gas to from water vapor and solid particles of sulfur.

$$2\,H_2S_{(g)} + O_{2(g)} \longrightarrow 2\,H_2O_{(g)} + 2\,S_{(s)}$$